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Topic:

X-ray backlit imaging of indirect drive implosions to measure in-flight capsule aspect ratio and convergent hydrodynamics* D.H. Kalantar, S.W. Haan, B.A. Hammel, O.L. Landen, C.J. Keane, and D.H. Munro - *Lawrence Livermore National Laboratory* - Both the efficiency of an implosion and the growth rate of hydrodynamic instabilities increase with the aspect ratio of an implosion. Doped ablators are used to study the physics of implosions with high Rayleigh-Taylor growth factors, by minimizing x-ray preheat and shell decompression, and hence increasing the in-flight aspect ratio. We present x-ray backlit images[1] of indirectly-driven capsules, and measurements of the in-flight aspect ratios for doped and undoped casules. The 4.7 keV images of the full capsule are recorded throughout the implosion phase with 50 ps and 15 μm resolution. We inferred the radial density profile as a function of time by Abel inverting the x-ray transmission profiles. We also extended this technique to image the spherically convergent Rayleigh-Talyor growth of preimposed modulations on the surface of a capsule. Comparison will be made with simulation.

[1] M. Katayama *et a l*, Rev. Sci. Instrum. 64, 706 (1993).

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